

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A computer-implemented method of simulating a memory circuit design in order to verify the signal strength of bit lines, the method comprising the steps of:

identifying, with a computer processor, circuit elements of the memory circuit design;

extracting at least one critical path circuit ~~a memory circuit path~~ from the circuit elements;

simulating the ~~memory circuit~~ critical path circuit;

measuring a maximum voltage difference between bit lines; and

comparing the maximum voltage difference between bit lines to a prescribed noise margin to verify the signal strength of the bit lines.

2. (Original) The method of claim 1 wherein the voltage difference between bit lines is the voltage difference between bit and bitb lines.

3. (Currently Amended) The method of claim 1 further comprising the step of identifying sense amplifier enable node after extracting the ~~memory circuit path~~ critical path circuit.

4. (Original) The method of claim 3 further comprising the step of measuring the voltage difference between bit lines at a sensing time controlled by the sense amplifier enable node.

5. (Original) The method of claim 4 further comprising the step of comparing the voltage difference between bit lines to a noise margin at the sensing time to verify the signal strength of the bit lines.

6. (Original) The method of claim 5 wherein the voltage difference between bit lines is the voltage difference between bit and bitb lines.

7. (Currently Amended) A system for simulating a memory circuit design in order to verify the signal strength of bit lines, the system comprising:

a computer including computer program configured to cause at least one processor to execute the following instructions:

identify circuit elements of the memory circuit design;

extract ~~a memory circuit path~~ at least one critical path circuit from the circuit elements;

simulate the ~~memory~~ critical path circuit;

measure a maximum voltage difference between bit lines; and

compare the maximum voltage difference between bit lines to a prescribed noise margin to verify the signal strength of the bit lines.

8. (Original) The system of claim 7 wherein the voltage difference between bit lines is the voltage difference between bit and bitb lines.

9. (Currently Amended) The system of claim 7 wherein the computer program is further configured to cause the processor to identify a sense amplifier enable node after extracting the ~~memory circuit path~~ critical path circuit.

10. (Currently Amended) The system of claim 9 wherein the computer program is configured to cause the processor to measure the voltage difference between bit lines at a sensing time controlled by the sense amplifier enable node.

11. (Currently Amended) The system of claim 10 wherein the computer program is configured to cause the processor to compare the voltage difference between bit lines to a noise margin at the sensing time to verify the signal strength of the bit lines.

12. (Original) The system of claim 11 wherein the voltage difference between bit lines is the voltage difference between bit and bitb lines.

13 - 22. (Canceled)

23. (Currently Amended) A computer-implemented method of characterizing a minimum circuit parameter sensitive to a noise disturbance against a prescribed noise margin in a circuit design, the method comprising the steps:

- (a) identifying, with a computer processor, circuit elements to be
characterized;
- (b) extracting a critical path netlist from the circuit elements;
- (c) simulating the critical path netlist with a maximum initial value of the
parameter under characterization;
- (d) simulating the critical path netlist with a minimum initial value of the
parameter under characterization;
- (e) calculating a criterion parameter;
- (f) determining whether both the simulations based on the initial minimum and
maximum values of the parameter under characterization indicate ~~the same status~~ a
success or failed status; and
- (g) ceasing simulation if both simulations indicate ~~the same status~~ a success
or failed status;
- otherwise,
- (h) setting current maximum and minimum values of the parameter to
the initial maximum and minimum values of the parameter, respectively;
- (i) determining a current value of the parameter under characterization
that is half a sum of the current maximum and minimum values of the
parameter;
- (j) simulating the critical path netlist with the current maximum and
minimum values of the parameter and determining against the prescribed
noise margin whether both the simulations indicate a success or failed status;
- (k) setting the current value of the parameter to the current minimum
value of the parameter if both simulations based on the current maximum and

minimum values of the parameter indicate a success or failure status; or
setting the current value of the parameter to the current maximum value of the
parameter otherwise; and

(l) repeating the steps (i) - (k) until the criterion parameter converges to
a prescribed bisection.

24 - 25. (Canceled).

26. (Currently Amended) The method of claim ~~[[24]]~~ 23 wherein the simulation indicates a ~~success or~~ failed status if a data output error of the simulation is above a prescribed threshold.

27. (Currently Amended) The method of claim ~~[[24]]~~ 23 wherein the simulation indicates a failed status if ~~[[the]]~~ measured noise is above the prescribed noise margin.

28. (Currently Amended) A system for characterizing a minimum value of circuit parameter against a prescribed noise margin, the system comprising:
a computer including computer program configured to cause at least one
processor to execute the following procedure:

- (a) identify circuit elements of the circuit to be characterized;
- (b) extract a critical path netlist from the circuit elements;
- (c) simulate the critical path netlist with a maximum initial value of the parameter under characterization;

(d) simulate the critical path netlist with a minimum initial value of the parameter under characterization;

(e) calculate a criterion parameter;

(f) determine whether the simulations based on the initial minimum and maximum values of the parameter indicate ~~the same status~~ a success or failed status; and

(g) halt operations if both simulations indicate ~~the same status~~; a success or failed status;

otherwise,

(h) set current maximum and minimum values of the parameter to the initial maximum and minimum values of the parameter, respectively;

(i) determine a current value of the parameter that is half the sum of the current maximum and minimum values of the parameter;

(j) simulate the critical path netlist with the current maximum and minimum values of the parameter and determine against the prescribed noise margin whether both the simulations indicate a success or failed status;

(k) set the current value of the parameter to the current minimum value of the parameter if both simulations based on the current maximum and minimum values of the parameter indicate a success or failure status, or set the current value of the parameter to the current maximum value of the parameter otherwise; and

(l) repeat the steps (i) - (k) until the criterion parameter converges to a prescribed bisection.

29-30. (Canceled)

31. (Currently Amended) The system of claim ~~[[30]]~~ 28 wherein the simulation indicates a failed status if a data output error of the simulation is above a prescribed threshold value.

32. (Currently Amended) The system of claim ~~[[30]]~~ 28 wherein the simulation indicates a failed status if measured noise is above the prescribed noise margin.

33-36. (Canceled)